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CLAIMS

We claim:

1. A bale kicker assembly for a round baler having a bale-forming chamber and a tailgate movable between a closed position during formation of the bale within the bale-forming chamber and an open position for discharging the bale from the bale-forming chamber, comprising:

an inner kicker section located below of the bale-forming chamber, wherein the inner kicker section is movable between a lowered discharge position and a raised position;

an outer kicker section having an inner end pivotably mounted to the inner kicker section and an outer end spaced rearwardly therefrom, wherein the outer kicker section is adapted to engage the ground when the inner kicker section is in its lowered position, and is raised above the ground when the inner kicker section is in its raised position;

a lifting and lowering arrangement interconnected with the inner kicker section for moving the inner kicker section between its raised and lowered positions;

wherein, when the inner kicker section is in its lowered position and the outer end of the outer kicker section is engaged with the ground, a bale discharged from the bale-forming chamber is received by the inner kicker section and moves away from the bale-forming chamber on the inner kicker section and the outer kicker section and, when the inner kicker section is moved to its raised position from its lowered position, the bale is moved off the outer kicker section and the outer end of the outer kicker section is positioned so as to prevent the bale from rolling toward the baler.

2. The bale kicker assembly of claim 1, wherein the inner end of the outer kicker section is pivotably mounted to the inner kicker section for movement about a substantially horizontal pivot axis.

3. The bale kicker assembly of claim 2, further comprising a stop arrangement interposed between the outer kicker section and the outer end of the inner kicker section for lifting the outer kicker section upon movement of the inner kicker section to its raised position.

4. The bale kicker assembly of claim 3, wherein the stop arrangement comprises a stop member secured to the inner end of the outer kicker section and a stop surface on the inner kicker section, wherein the stop member and stop surface are configured to maintain the outer end of the outer kicker section in engagement with the ground during initial movement of the inner kicker section from its lowered position toward its raised position, and thereafter engage each other to lift the outer end of the outer kicker section above the ground so as to move the bale off the outer kicker section, wherein the outer end of the outer kicker section engages the bale after movement of the bale off the outer kicker section to prevent the bale from rolling toward the baler.

5. The bale kicker assembly of claim 2, further comprising a transport latch member interconnected with the tailgate and engageable with the outer kicker section for maintaining the outer kicker section above the ground when the baler is not in use.

6. The bale kicker assembly of claim 5, wherein the transport latch member comprises a hook member engageable with the outer kicker section, and wherein the outer kicker section and the hook member are configured such that movement of the tailgate to its open position causes the hook member to move along the outer kicker section such that the hook member moves out of engagement with the outer kicker section so as to allow movement of the outer kicker section.

7. The bale kicker assembly of claim 2, wherein the inner kicker section is mounted for pivoting movement about a substantially horizontal pivot axis between its raised and lowered positions.

8. The bale kicker assembly of claim 7, wherein the lifting and lowering arrangement comprises a cylinder assembly interconnected with the inner kicker section, wherein the cylinder assembly includes an extendible and retractable member operable to cause movement of the inner kicker section between its lowered and raised positions.

9. A round baler, comprising:

a bale-forming chamber defined by a series of side-by-side baler belts;

a tailgate with which the baler belts are engaged, wherein the tailgate is movable between a closed position during bale formation and an open position for discharging the bale rearwardly from the bale-forming chamber; and

a bale kicker for facilitating movement of the bale onto the ground when the tailgate is in its open position and the bale is discharged from the bale-forming chamber, comprising an inner section located below of the bale-forming chamber, wherein the inner section is movable between a raised retaining position and a lowered discharge position, and an outer section movably mounted to the inner section, wherein the outer section is configured to engage the ground when the inner section is in its lowered position to facilitate movement of the bale onto the ground, and is configured to engage the bale when the inner section is moved to its raised retaining position to prevent movement of the bale toward the baler during movement of the tailgate from its open position toward its closed position.

10. The round baler of claim 9, wherein the outer section of the bale kicker is movably mounted to the inner section by means of a pivot connection interposed between the inner section of the bale kicker and an inner end defined by the outer section of the bale kicker.

11. The round baler of claim 10, wherein the pivot connection enables the outer section of the bale kicker to pivot freely relative to the inner section when the inner section is moved to its lowered discharge position, in response to engagement of an outer end defined by the outer section with the ground, and further comprising a stop arrangement interposed between the inner section and the outer section of the bale kicker for lifting the outer section upwardly when the inner section is moved from its lowered discharge position to its raised retaining position.

12. The round baler of claim 11, wherein the stop arrangement is configured so as to lift the outer end of the outer section upwardly when the inner section attains a predetermined position during movement from its lowered discharge position toward its raised retaining position, to move the bale off the outer section of the bale kicker, and to maintain the outer end of the outer section at an elevation above the ground sufficient to prevent the bale from rolling on the ground toward the baler when the inner section of the bale kicker is in its raised retaining position.

13. The round baler of claim 9, further comprising a sensor arrangement for detecting the presence of a bale on the bale kicker when the tailgate is in its open

position, and for preventing movement of the tailgate from its open position toward its closed position when the bale is located in a predetermined position on the bale kicker.

14. The round baler of claim 13, wherein the tailgate is movable between its open and closed positions by means of one or more tailgate cylinder assemblies which are extendible and retractable so as to move the tailgate between its open and closed positions, wherein the sensor arrangement interacts with a pressurized fluid circuit in which the tailgate cylinder assemblies are arranged, so as to prevent operation of the tailgate cylinder assemblies to move the tailgate to its closed position from its open position.

15. The round baler of claim 14, wherein the sensor arrangement includes a pivotable arm movable between a first position when engaged with a bale in a predetermined location on the bale kicker, and a second position when the bale is moved outwardly past the predetermined location on the bale kicker, wherein the arm is interconnected with a valve actuator, wherein the valve actuator is movable from an operative position in which the valve actuator actuates a valve in the pressurized fluid circuit when the inner section of the bale kicker is moved from its lowered discharge position to its raised retaining position and the arm is in its first position, and is movable to a disengaged position in which the valve actuator fails to actuate the valve when the inner section of the bale kicker is moved from its lowered discharge position to its raised retaining position, wherein failure to actuate the valve prevents operation of the tailgate cylinder assemblies so as to prevent movement of the tailgate from its open position toward its closed position.

16. The round baler of claim 10, further comprising a transport latch arrangement interposed between the tailgate and the outer section of the bale kicker, wherein the transport latch arrangement is operable to maintain the outer section of the bale kicker in an elevated position when the round baler is not in use.

17. The round baler of claim 16, wherein the transport latch arrangement comprises a depending latch member extending downwardly from the tailgate and engaged with the outer section of the bale kicker, and wherein the latch member is adapted to move along the outer section of the bale kicker during movement of the tailgate from its closed position toward its open position, and wherein the latch member

and the outer section of the bale kicker are configured so as to enable the latch member to move out of engagement with the outer section of the bale kicker when the tailgate is moved to its open position.

18. A method of discharging a round bale from the bale-forming chamber of a round baler, wherein the round baler includes a tailgate movable between a closed position during bale formation and an open position for discharging the bale from the bale-forming chamber, comprising the steps of:

5 positioning a movable bale kicker rearwardly of the bale-forming chamber, wherein the bale kicker includes an inner section movable between a raised and lowered position and an outer section pivotably mounted to the inner section;

 moving the bale kicker inner section to its lowered position so as to receive a bale discharged from the bale-forming chamber, wherein movement of the
10 bale kicker inner section to its lowered position causes at least an outer end defined by the bale kicker outer section to engage the ground, wherein the bale is adapted to travel from the bale kicker inner section onto the bale kicker outer section when the inner section is in its lowered position;

 subsequently moving the bale kicker inner section toward its raised
15 position, wherein the bale kicker outer section is adapted to move upwardly during movement of the bale kicker inner section from its lowered position toward its raised position, wherein upward movement of the bale kicker outer section results in the outer end of the bale kicker outer section being raised off the ground so as to move the bale off the bale kicker outer section and to engage the outer end of the bale kicker outer
20 section with the bale and to thereby prevent movement of the bale toward the baler.

19. The method of claim 18, further comprising the step of moving the tailgate from its open position to its closed position after movement of the bale kicker inner section from its lowered position to its raised position.

20. The method of claim 19, further comprising the step of preventing movement of the tailgate from its open position to its closed position in the event the bale has not moved passed a predetermined position on the bale kicker when the bale kicker inner section has been moved to its raised position.

21. The method of claim 20, wherein the step of preventing movement of the tailgate from its open position to its closed position is carried out by sensing the presence of a bale at or inwardly of the predetermined position on the bale kicker, and disabling operation of a pressurized fluid circuit within which one or more tailgate cylinders are connected, wherein the tailgate cylinders are operable to move the tailgate between its open and closed positions.

22. A bale kicker mechanism for use with a round baler having a bale-forming chamber and a tailgate interconnected with a tailgate operating mechanism which is operable to move the tailgate between a closed position during bale formation and an open position for discharging the bale from the round baler, comprising:

a bale kicker movable between a lowered position when the tailgate is moved to its open position so as to receive the bale discharged from the bale-forming chamber and to facilitate movement of the bale from the bale-forming chamber onto the ground, and a raised position in which the bale kicker is moved upwardly from its lowered position; and

a sensing arrangement interconnected with the tailgate operating mechanism for sensing the presence of a bale at or inwardly of a predetermined position on the bale kicker, wherein the sensing arrangement functions to prevent operation of the tailgate operating mechanism so as to move the tailgate toward its closed position in the event the bale is located at or inwardly of the predetermined position on the bale kicker.

23. The bale kicker mechanism of claim 22, wherein the tailgate operating mechanism comprises one or more extendible and retractable tailgate cylinder assemblies interconnected in a pressurized fluid circuit, and wherein the sensing arrangement interacts with the pressurized fluid circuit so as to prevent operation of the tailgate cylinder assemblies to move the tailgate to its closed position in the event the bale is located at or inwardly of the predetermined position on the bale kicker.

24. The bale kicker mechanism of claim 23, wherein the sensing arrangement includes a biased arm member located in the path of movement of the bale as the bale moves on the bale kicker at or inwardly of the predetermined location on the bale kicker, and a valve actuator interconnected with the biased arm, wherein the valve

- 5 actuator is in a first position when the biased arm is not engaged with a bale wherein movement of the bale kicker to its raised position causes the valve actuator to actuate a valve in the pressurized fluid circuit so as to allow operation of the tailgate cylinder assemblies so as to move the tailgate from its open position to its closed position, and wherein the valve actuator is moved to a second position in response to engagement of
- 10 the biased arm with a bale wherein, when the valve actuator is in its second position, the valve actuator fails to actuate the valve upon movement of the bale kicker to its raised position, wherein failure to actuate the valve prevents operation of the pressurized fluid circuit to prevent movement of the tailgate cylinder assemblies to move the tailgate toward its closed position.

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